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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/784,093      | 02/20/2004  | Wounjhang Park       | 226251              | 6898             |

23460 7590 09/09/2004

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| EXAMINER |
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LE, HOA T

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1773

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/784,093 | <b>Applicant(s)</b><br>PARK ET AL. |  |
|                              | <b>Examiner</b><br>H. T. Le          | <b>Art Unit</b><br>1773            |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>Feb. '04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the term “thin” renders the claim indefinite because it’s a relative term and thus the metes and bounds of the “thin coating” of the coated phosphor as claimed cannot be ascertainable. Other claims are deemed indefinite in view of their dependency upon claim 1.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishio et al (US 5,856,009).

Claim 1: Nishio et al disclose a luminescent phosphor particle comprising an uncoated phosphor coated with a rare-earth oxide. See col. 4, lines 30-33 and 35-39. The coating is required to be thin because one of the main purposes sought by Nishio is to maintain the brightness of the uncoated phosphor; a thick coating would have defeated that purpose. See col. 1, lines 4-8 and 40-44; and col. 8, lines 6-8.

Claims 2-6: See col. 6, lines 15-16.

Claim 7: See col. 6, lines 36-38.

4. Claims 1, 2 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by: (a) Flaherty (US 4,459,507), (b) Ranby et al (US 4,396,863) or (c) Fujino (US 5,438,234).

a. The Flaherty reference:

Claims 1 and 7: See claims 1 and 2. A coating thickness of 120 Å to 600 Å definitely qualifies the broad term “thin” as claimed.

b. The Ranby reference:

Claim 1: See claim 1. With regard to the “thin” coating as claimed, as shown in examples 1-4 (tables at col. 2, 3 and 4 in particular), the brightness of the coated phosphor reduced only by less than 1% as compared to the uncoated phosphor. Thus, it necessarily indicates that the coating is thin enough that the brightness of the uncoated phosphor is substantially unaffected.

Claim 7: See examples 1- 2 where yttrium oxide is used in the coating.

c. The Fujino reference:

Claims 1 and 7: See claim 1. With regard to the “thin” coating as claimed, claim 7 of the Fujino reference recites average particle size of the coating being smaller by from 1 to 3 microns than the average particle size of the phosphor. This requirement necessarily results in a coating thickness that is smaller than the particle size of the phosphor and thus qualifies as a “thin” coating.

5. Claims 1, 2 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Okada et al (US 5,523,018).

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Claim 1: See col. 2, lines 31-38. Because the coating is present just up to 5 wt% of the total coated particle, it is necessarily inherent that the coating thickness is "thin".

Claim 2: col. 4, lines 41-60.

Claim 7: col. 3, lines 49-50.

*Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flaherty, Ranby or Fujino as applied to claims 1 and 7 above, and further in view of the discussion set forth below.

Claims 2-6: Though Flaherty, Ranby and Fujino do not explicitly teach sulfide-based or in particular, copper-activated sulfide zinc (ZnS:Cu) phosphor, it is suggested in these references that phosphors that emit green light when exposed to UV irradiation in fluorescent materials would be suitable. See Flaherty, col. 2, lines 37-39; Ranby, col. 1, lines 10-14; Fujino, col. 2, lines 57-60. ZnS:Cu is a green-emitted phosphor and is currently the most used in fluorescent lamp.\* Therefore, it would have been obvious for one having ordinary in the art to employ (or substitute the silicate phosphor taught by Flaherty with)

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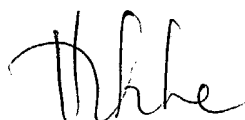
\* Support for this statement can be found in US 4,208,299 to Oikawa et al (col. 1, lines 14-17); US 5,118,529 to Klinedist (col. 1, lines 22-27); or US 6,207,077 to Burnell-Jones (col. 1, lines 54-64).

ZnS:Cu as the uncoated phosphor because ZnS:Cu has been for decades and presently is the commercially most used green-emitted phosphor in fluorescent lamp.\*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



H. T. Le  
Primary Examiner  
Art Unit 1773